

REMARKS

Claims 8-17 are pending in the present application.

The rejections of Claims 12, 13, and 15-17 under: **(a)** 35 U.S.C. §102(b) over US 4,308,404, US 4,391,997, or US 4,400,555, each optionally in view of US 5,777,180, **(b)** 35 U.S.C. §103(a) over US 5,780,690 or JP 10-175898, each optionally in view of US 4,391,997 and US 4,400,555, and **(c)** 35 U.S.C. §103(a) over US 4,308,404, US 4,391,997, or US 4,400,555, each optionally in view of US 5,777,180, are obviated by amendment.

Claim 12 provides a process for producing bisphenol A comprising condensing phenol and acetone in the presence of, as a catalyst, an acid type ion exchange resin which is modified in part with a sulfur-containing amine compound, wherein the phenol and acetone are subjected to condensation reaction in reaction equipment equipped with at least two reactors in series, and wherein said ion exchange resin has a different modification rate in accordance with the concentration of methanol in acetone, and wherein an ion exchange resin having a modification rate in the range of 10 to less than 20 mol% is used for a methanol concentration in acetone of lower than 250 ppm by weight, and an ion exchange resin having a modification rate in the range of 20 to 65 mol% is used for a methanol concentration in acetone being in the range of 700 to 8000 ppm by weight.

Applicants submit that none of US 4,308,404, US 4,391,997, or US 4,400,555, US 5,780,690 and JP 10-175898, even when viewed in conjunction with US 5,777,180, disclose or suggest the present invention as claimed.

In order for a reference to anticipate an invention, the reference "must teach every

element of the claim” (MPEP §2131). Applicants note that at no point do US 4,308,404, US 4,391,997, or US 4,400,555, disclose or suggest “an ion exchange resin having a modification rate in the range of 20 to 65 mol% is used for a methanol concentration in acetone being in the range of 700 to 8000 ppm by weight.” Therefore, US 4,308,404, US 4,391,997, and US 4,400,555 fail to meet the standard for anticipation. As such the anticipation rejection is no longer tenable.

Moreover, “to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation... to modify the reference... Second, there must be a reasonable expectation of success. Finally, the prior art reference... must teach or suggest all the claim limitations.” (MPEP §2142) In the present case, Applicants note that the art of record is silent with respect to the aforementioned element of the claim and provides no suggestion or motivation to arrive at the same, much less an expectation of the results flowing therefrom.

In view of the foregoing, Applicants request withdrawal of these grounds of rejection.

The rejection of Claims 8-17 under 35 U.S.C. §103(a) over JP 10-251179 optionally in view of US 5,780,690, US 4,391,997, and US 4,400,555, is obviated by amendment.

Claim 8 provides a process for producing bisphenol A comprising condensing phenol and acetone in the presence of, as a catalyst, an acid type ion exchange resin which is modified in part with a sulfur-containing amine compound, wherein said condensing is performed in reaction equipment which comprises at least two reactors in series, and wherein an ion exchange resin having a modification rate in the range of 26 to 65 mol% is used for a methanol concentration in acetone being in the range of 700 to 8000 ppm by weight. An

important element of Claim 8 that is neither disclosed, nor suggested by JP 10-251179 is the multistage system, which is described on page 10, lines 19-24 of the present specification. For example, see Example 1 of JP 10-251179 in which only a single stage reaction is conducted. Further, none of the art of record utilizes a multistage reaction system and, therefore, US 5,780,690, US 4,391,997, and US 4,400,555 fail to compensate for this deficiency in the disclosure of JP 10-251179. As such, the combined disclosures of JP 10-251179, US 5,780,690, US 4,391,997, and US 4,400,555 fail to even support a *prima facie* case of obviousness (see MPEP 2142).

Moreover, Applicants submit that the combined disclosures of the art of record fail to provide any reasonable expectation of the advantages flowing from the presently claimed invention. Therefore, even if a *prima facie* case of obviousness could be made, such a rejection is rebutted.

As recognized by the Examiner, US 4,391,997 and US 4,400,555 do not disclose the methanol content in acetone. Applicants further note that ion exchange resins employed therein have a modification rate of about 10 mol% (see Examples). Although US 5,777,180 (cited by the Examiner as allegedly evidencing that the amount of methanol would be inherent in the prior art acetone feeds) disclose a methanol content in acetone may be about 200 ppm, none of the art of record disclose the use of acetone containing a high amount of methanol.

The Examiner points to Example 1 of JP 10-251179 (i.e., the closest example to the present invention) in which bisphenol A is produced using an ion exchange resin having a modification rate of 30 mol% and acetone containing 1 wt% (10,000ppm) methanol, which is in vast excess of the claimed range. The Examiner's attention is directed to Comparative

Example 2 of the present invention, which approximates Example 1 of JP 10-251179. In Comparative Example 2 of the present invention, bisphenol A is produced using an ion exchange resin having a modification rate of 25 mol% and acetone containing 10,000ppm methanol. As evidenced by Table 1-2 (reproduced below), the conversion of phenol in Comparative Example 2 is significantly reduced as compared to the Examples within the scope of the present invention (see for example Examples 3-6).

Table 1—2

Conversion of Phenol (%)

|                     | <u>First Stage Reaction</u> |              |              | <u>Second Stage Reaction</u> |              |              |
|---------------------|-----------------------------|--------------|--------------|------------------------------|--------------|--------------|
|                     | Start of Reaction           | after 300Hrs | after 600Hrs | Start of Reaction            | after 300Hrs | after 300Hrs |
| Example 1           | 12. 2                       | 10. 8        | 8. 7         | 15. 5                        | 13. 7        | 11. 2        |
| Example 2           | 12. 5                       | 11. 2        | 9. 9         | 15. 6                        | 14. 2        | 13. 3        |
| Example 3           | 12. 1                       | 10. 9        | 9. 4         | 15. 2                        | 13. 8        | 13. 1        |
| Example 4           | 10. 9                       | 8. 2         | 7. 1         | 14. 5                        | 12. 5        | 11. 8        |
| Comp'tive Example 1 | 12. 3                       | 6. 2         | 4. 1         | 15. 6                        | 8. 1         | 6. 3         |
| Comp'tive Example 2 | 12. 3                       | 6. 0         | 3. 7         | 15. 4                        | 8. 3         | 4. 3         |
| Comp'tive Example 3 | 12. 0                       | 7. 2         | 3. 4         | 15. 0                        | 10. 9        | 5. 2         |
| Comp'tive Example 4 | 10. 6                       | 6. 2         | 3. 9         | 14. 1                        | 11. 0        | 6. 1         |
| Example 5           | 11. 5                       | 10. 7        | 9. 5         | 14. 9                        | 13. 7        | 13. 0        |
| Example 6           | 10. 5                       | 8. 0         | 6. 9         | 13. 7                        | 11. 8        | 11. 1        |

Methanol is poisonous toward the catalyst of ion exchange resins. Therefore, the present invention provides an important commercial advantage in that the use of a multistage reaction system results in a prolongs life of the catalyst of ion exchange resins, in particular

by permitting the separate addition of acetone into each catalyst bed in the multistage reaction system. The use of and advantages of a multistage reaction system is neither disclosed nor suggested by the combined disclosures of JP 10-251179, US 5,780,690, US 4,391,997, and US 4,400,555. Therefore, Claim 8 and the claims dependent therefrom are not obvious in view of the art of record.

In regard to Claim 12, Applicants note that JP 10-251179, even when combined with the disclosures of US 5,780,690, US 4,391,997, and US 4,400,555, fails to disclose or fairly suggest all the limitations of the presently claimed invention. Specifically, the art of record fails to disclose or fairly suggest "an ion exchange resin having a modification rate in the range of 20 to 65 mol% is used for a methanol concentration in acetone being in the range of 700 to 8000 ppm by weight." Therefore, Claim 12 and the claims dependent therefrom are not obvious in view of the art of record.

In view of the foregoing, Applicants request withdrawal of this ground of rejection.

Applicants respectfully request that the obviousness-type double patenting rejection of Claims 8-17 over Claims 1-13 of US 6,740,784 be held in abeyance until an indication of allowable subject matter in the present application. If necessary, a terminal disclaimer will be filed at that time. Until such a time, Applicants make no statement with respect to the propriety of this ground of rejection.

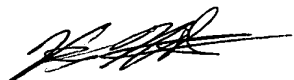
Finally, Applicants respectfully request that the provisional double patenting rejection of Claims 8-17 over co-pending U.S. Application No. 10/433,155 in view of US 4,400,555, be held in abeyance until an indication of allowable subject matter in the present application.

If necessary, a terminal disclaimer will be filed at that time. Until such a time, Applicants make no statement with respect to the propriety of this ground of rejection. Of course, since this provisional rejection has been made over a co-pending application, should the present application be allowable but for the provisional double patenting rejection, the Examiner is reminded that this rejection should be withdrawn and the present application passed to allowance.

Applicants submit that the present application is in condition for allowance. Early notification to this effect is respectfully requested.

Respectfully submitted,

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